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faction either to the student or his professor.

Finally the belief may be emphasized that experience in actual investigation must be of immense benefit to the student who wishes to approach medicine in the scientific spirit which the times demand. The use of sphygmographic tracings, blood-pressure determinations, and quantitative chemical analyses as every-day aids in the elucidation of a diagnosis requires a mind trained to think in such terms. This is the reason the student turns to the laboratory. He wishes to find out how problems of investigation are approached in order that he may make successful problems of his cases. If, as Dr. Howell believes, "the group of serious workers in medical science will be recruited from this body of students," from the men who, in the words of Dr. Wells, will approach each case "in the same spirit that a laboratory man approaches his problems"—then surely it is worth while to make room in the curriculum for their growth.

CECIL K. DRINKER

UNIVERSITY OF PENNSYLVANIA

SCIENTIFIC NOTES AND NEWS

THE council of the Royal Society has made awards as follows: A Royal medal to Professor William Mitchinson Hicks, F.R.S., for his researches in mathematical physics and investigations on the theory of spectroscopy. A Royal medal to Professor Grafton Elliot Smith, F.R.S., for his researches on the comparative anatomy of the brain. The Copley medal to Professor Felix Klein, of Göttingen, For.Mem.R.S., for his researches in mathematics. The Rumford medal to Professor Heike Kamerlingh Onnes, of Leyden, for his researches at low temperatures. The Davy medal to Professor Otto Wallach, of Göttingen, for his researches on the chemistry of the essential oils and the cyclo-olefines. The Darwin medal to Dr. Francis Darwin, F.R.S.,

for his work in conjunction with Charles Darwin, and for his researches in vegetable physiology. The Buchanan medal to Colonel William C. Gorgas, of the United States Army, for his sanitary administration of the works of the Panama Canal. The Hughes medal to Mr. William Duddell, F.R.S., for his investigations in technical electricity.

THE council of the Royal Society has made nominations for the year 1913 as follows: *President*, Sir Archibald Geikie; *Treasurer*, Sir Alfred B. Kempe; *Secretaries*, Sir John Bradford, Professor A. Schuster; *Foreign Secretary*, Dr. D. H. Scott; *Other Members of the Council*, Lieut.-Col. A. W. Alcock, Mr. A. J. Balfour, Sir William Crookes, Dr. F. W. Dyson, Professor W. Gowland, Sir Joseph Larmor, Professor E. W. MacBride, Mr. W. B. Hardy, Professor Micaiah J. M. Hill, Sir Ronald Ross, Professor G. Elliot Smith, Professor A. Smithells, Dr. J. J. Harris Teall, Professor Silvanus P. Thompson, Sir J. J. Thomson and Sir Philip Watts.

CAPTAIN ROALD AMUNDSEN, who lectured before the Scottish Geographical Society on November 21, was given the Livingstone Gold Medal of the society.

PROFESSOR G. A. MILLER, of the University of Illinois, was elected a corresponding member of the Spanish Mathematical Society at its general meeting, held at Madrid, April 26, 1912. The only other corresponding member of this society is M. H. Brocard, of Bar-le-Duc, France.

THE governing body of Magdalene College, Cambridge, has awarded a research studentship to Mr. E. Hindle, B.A., Beit fellow, who has been working at pathogenic protozoa in the laboratory of Professor Nuttall.

THE annual public address of the Entomological Society of America will be given at the Cleveland meeting of the society on Wednesday evening, January 1, at 8:00 P.M., by Dr. Philip P. Calvert, of the University of Pennsylvania. His subject will be "An Entomologist in Costa Rica." He will give an account of a year spent in this entomologically

very rich country, primarily for the study of the seasonal distribution, life-history and habits of Odonata, but including references to other groups of insects, characteristics of various collecting grounds and topics of general interest.

MR. NEWTON D. BAKER, mayor of the city of Cleveland, will give a series of public addresses on four successive Sunday evenings, at 8:00 o'clock, in the Amasa Stone Memorial Chapel of Western Reserve University. The dates and subjects are as follows:

November 24—"The City's Housekeeping."

December 1—"The City's Safety."

December 8—"The City's Health."

December 15—"The City's Ideals."

This series of lectures is a part of the university's program of coordination with municipal and other public interests.

THE College of Engineering of the Ohio State University will offer a course of nine lectures this winter. Prominent engineers and business men will be among the speakers. The purpose of the course is to broaden the acquaintance of the engineering students in the general field of engineering. On January 24, Mr. C. E. Skinner, M.E., of the Westinghouse Company, will lecture on "Research in its Relation to Manufacturing Problems."

PROFESSOR C. E. A. WINSLOW, of the College of the City of New York, lectured on November 21, before the Columbia Chapter of the society of Sigma Xi, on "Some Newer Aspects of the Public Health Campaign."

IN a recent address before the Minnesota Pathological Society, Professor Ludwig Hektoen, head of the department of pathology and bacteriology in the University of Chicago, discussed the epidemics traceable to contamination of milk with streptococci, particularly the epidemic of sore throat in Chicago last winter which involved not less than 10,000 cases and was traced to contamination of a definite milk supply.

At the meeting of the College of Physicians, Philadelphia, on November 6, portraits

of the late John H. Musser, Isaac Hays and Wharton Sinkler were presented to the college, the addresses being made by Drs. George A. Piersol, George E. DeSchweinitz and James C. Wilson, respectively.

DR. ARTHUR TRACY CABOT, the distinguished Boston surgeon, a fellow of the corporation of Harvard University, has died at the age of sixty-two years.

THE death is announced, at the age of ninety years, of M. Aimé Pagnoul, a correspondent of the Paris Academy of Sciences in the section of rural economy.

A COMMITTEE consisting of Drs. Clarence John Blake, John Warren and Frederic T. Lewis, appointed to prepare a memorial to Dr. Leonard Worcester Williams, has presented the following report:

Dr. Leonard Worcester Williams, instructor in comparative anatomy, died in the thirty-eighth year of his age, while absorbed in his work at the Harvard Medical School. Dr. Williams was a naturalist by instinct and education, and took great delight in examining marine creatures of all sorts. In this way he acquired rare technical skill in dissection and broad knowledge of the structure of animals. In 1907 he joined the department of comparative anatomy, and became at once a welcome and most valuable member of the staff. Exquisite preparations remain as permanent mementos of his industry, and his publications are those of an earnest student, careful, painstaking and exact. Of Dr. Williams's personal traits none was more generally recognized than his obliging readiness to help others. During the recent Otological Congress he left his work at the Biological Laboratory in Woods Hole to arrange and direct the display of microscopic specimens. For two weeks in mid-summer his time was at the disposal of the congress, in one form or another of helpfulness. In recognition of such loyal service, freely rendered throughout the five years that Dr. Williams was our associate, we record our high appreciation of his labor in our behalf, and our deep sense of loss in his death.

IN connection with Mr. Andrew Carnegie's offer to provide pensions for future ex-presidents of the United States and their widows—chiefly interesting to university men for the

light it throws on his provision of pensions for professors—it is announced that Mr. Carnegie has transferred \$125,000,000 to the Carnegie Corporation of New York incorporated under the act of the legislature introduced on March 22 last year. This corporation has eight trustees, five of whom are the heads of the five institutions which Mr. Carnegie has founded—the Carnegie Endowment for International Peace, the Carnegie Foundation for the Advancement of Teaching, the Carnegie Institution of Washington, the Carnegie Hero Fund, and the Carnegie Institute of Pittsburgh. The heads of these are Senator Elihu Root, Dr. Henry S. Pritchett, Dr. Robert S. Woodward, Mr. Charles L. Taylor and Dr. William N. Frew. The other three trustees are Mr. Carnegie, Mr. Robert A. Franks, president of the Home Trust Company, and Mr. James Bertram, Mr. Carnegie's secretary. By the act of the legislature the incorporators were authorized "to receive and maintain a fund and apply the income to promote the advancement and diffusion of knowledge among the people of the United States by aiding technical schools, institutions of higher learning, libraries, scientific research, hero funds, useful publications, and by such other agencies and means as shall from time to time be found appropriate."

AFTER the annual meeting of the trustees of the Carnegie Foundation for the Advancement of Teaching last week it was announced that forty-eight pensions and retirement allowances had been granted during the year, making a total of three hundred and ninety-eight now in force at an annual expenditure of \$570,000. Dr. William F. Slocum, president of Colorado College, was elected to the vice-chairmanship of the board to fill the place of Dr. David Starr Jordan, resigned. Endowments of the Foundation now amount to \$14,000,000, Mr. Carnegie having added \$2,000,000 since the meeting of the trustees a year ago. The foundation was created with a fund of \$10,000,000 and a promise of \$5,000,000 more from Mr. Carnegie when it was needed for the state universities. The gift an-

nounced last week makes three of the additional five million; during the first years of the foundation's existence it saved \$1,000,000 of its income.

THE U. S. Civil Service Commission announces a competitive examination for inorganic chemist, for men only, on December 4 to fill vacancies in this position in the Bureau of Insular Affairs, Philippine Service, at salaries ranging from \$1,400 to \$2,000 a year.

THE Illinois Civil Service Commission expects to hold an examination in Chicago on December 14, 1912, to furnish an eligible list for the position of curator of the State Museum. Applicants are not restricted to residence in Illinois but the law requires that they must be geologists and over twenty-five years of age. The present salary is \$250 per month. The examination will cover the training and experience of the applicant and in addition will include questions on geology and natural science, museum organization and administration and methods of collection and exhibition of specimens in large museums. A portion of the examination will be oral. This is the first time that such an examination has ever been held for scientific positions in the state service of Illinois.

THE committee in charge of the Sarah Berliner Research Fellowship for Women offers annually a fellowship of the value of one thousand dollars, available for study and research in physics, chemistry or biology, in either America or Europe. This fellowship is open to women holding the degree of doctor of philosophy, or to those similarly equipped for the work of further research. Applications for this fellowship must be in the hands of the chairman of the committee, Mrs. Christine Ladd Franklin, 527 Cathedral Parkway, New York, by the first of January of each year.

SECTION F of the American Association for the Advancement of Science will hold one session at Cleveland for the address of Vice-president Nachtrieb. All papers will be re-

ferred to the program committee of the American Society of Zoologists, and will be read by title only if there is not time for presentation at the announced meetings of that society. Titles and abstracts should be sent to Professor W. C. Curtis, Columbia, Mo., before December 1.

THE fourth annual meeting of the American Phytopathological Society will be held in conjunction with the American Association for the Advancement of Science, at Cleveland, Ohio, December 31, 1912, to January 3, 1913. Titles of papers should reach the secretary not later than December 10 to insure their appearance in the society's program. Papers should not require more than ten to fifteen minutes, and in no case exceed twenty minutes, for presentation. Abstracts not exceeding 200 words, and preferably 100, of all papers to be presented should be submitted with the titles, if possible. In order to appear in the official report of the meeting, all abstracts must be in the secretary's hands at the close of the meeting. The pathological exhibition, which was such an interesting and successful feature of the Washington meeting, will be continued at Cleveland. Correspondence in regard to exhibits and space should be addressed to Professor A. D. Selby, Wooster, Ohio. Facilities will be provided for displaying exhibits of all kinds.

THE Ohio Academy of Science will hold its annual session at the Ohio State University, November 28-30. The program contains fifty papers. The academy will decide the question of establishing a series of publications which shall include the results of the work done for the Biological Survey of Ohio, which was recently established by the Ohio State University. Several of the colleges of the state are cooperating with the university in making the survey.

THE New York State Science Teachers Association will hold its annual meeting in the Central High School, Syracuse, N. Y., on December 26-28, 1912. The sections are:

(a) Physics and Chemistry, (b) Biology and Nature Study, (c) Home Economics.

THE International Union for Solar Research will meet at Bonn beginning August 1, 1913.

A SOCIETY for the study of medical history has been established in London as a section of the Royal Society of Medicine. The first meeting was held on November 20.

THE fourth Congress of Physiotherapy will be held at Berlin, March 26-30, 1913, under the presidency of Professor His. The principal subject proposed for discussion is the treatment of disturbances of the circulation. The work of the congress will be divided among four sections: (1) hydrotherapy, balneology, seaside and climatic treatment; (2) electro-therapy and radium-therapy; (3) orthopedics, movement treatment and massage; (4) dietetics. There will be an exhibition in connection with the congress.

THE tenth International Congress of Agriculture will be held at Ghent next year. The Belgian government and the provincial councils as well as the municipal authorities of Ghent have promised their support to this congress. The various foreign governments have been asked to send delegates. The opportunity of visiting the agricultural exhibition, or "The Modern Village" as it will be called, and the numerous excursions which will be arranged, will make the congress one of special interest. County councils, agricultural societies and colleges, professors of agriculture, farmers, market gardeners and agriculturists generally in all parts of the world are invited to become members of the congress. The reports and proceedings, to be issued in six volumes, will form an agricultural encyclopedia of all subjects of current interest. The congress will meet from the eighth to the thirteenth of June inclusive. Applications for membership, enclosing a money order for 20 francs, should be sent to M. Inspector Vandervaeren, 228, chaussée d'Alseberg, Brussels. The American committee, so far formed, consists of the follow-

ing: Dr. L. O. Howard, member of the International Commission on Agriculture and chief, Bureau of Entomology; Dr. A. C. True, director, Office of Experiment Stations; Mr. John Hamilton, specialist in farmers' institutes, Office of Experiment Stations; Dr. C. F. Langworthy, chief, nutrition investigation, Office of Experiment Stations; Dr. J. I. Schulte, assistant agriculturist, Office of Experiment Stations.

THE last Congress made appropriations for the U. S. Geological Survey for the fiscal year ending June 30, 1913, as follows:

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| Topographic surveys | \$350,000 |
| Geologic surveys | 300,000 |
| Mineral resources of Alaska | 90,000 |
| Mineral resources of the United States .. | 75,000 |
| Chemical and physical researches | 40,000 |
| Geological maps of the United States .. | 110,000 |
| Gaging streams, etc. | 150,000 |
| Surveying national forests | 75,000 |

The bill also appropriates \$145,000 for printing and binding survey reports, to be expended by the public printer.

THE will of the late Catherine E. Beecher, in compliance with the wishes of her husband, bequeaths her estate for the endowment of a department in the Academy of Natural Sciences of Philadelphia to be known as the J. F. Beecher Biological and Anthropological Laboratory. The bequest, with the conditions defined in the will, has been accepted by the academy. The estate is to be kept intact for ten years before the income is available for the designated purpose.

AMONG the geological and mineralogical collections of the United States National Museum is an odd boulder of solid copper, known as the Ontonagon Boulder, which has a very interesting history. This large mass of copper has been in the possession of the Smithsonian Institution since 1860, and has recently been moved to the new museum building, where it is now on exhibition in the southeast corner of the east hall on the second floor. The boulder has the appearance of a dull bronze-colored rock, much chipped and worn. It is 3½ feet long, 3 feet wide and 1½ feet in its

thickest part, and owing to the great density of copper, weighs nearly 3 tons, a large weight for such a relative small bulk. For ages this remarkable mass of copper lay on the west bank of the Ontonagon River in the upper peninsula of Michigan, where it was known for many years by the Chippewa Indians of that region. It was not until 1766, however, that the first white man, Alexander Henry, an English adventurer and trader, visited this remarkable specimen. During the next 75 years many explorers and scientists followed Henry's footsteps until the boulder became well known as a mineralogical curiosity. It was undoubtedly a valuable specimen worth several thousands of dollars, but its weight prevented any one from making away with it. In 1841, Julius Eldred, a hardware merchant of Detroit purchased this copper rock from the Chippewa Indians on whose lands it was located, and two years later, after many difficulties, succeeded in transporting it down the Ontonagon River, through Lake Superior to Sault Ste. Marie, and thence to Detroit, where it was placed on exhibition for a brief period. Soon after its arrival, the government claimed it, and towards the end of 1843 it was shipped to Washington and deposited in the yard of the Quartermaster's Bureau of the War Department, where it remained until 1860, when it was transferred to the Smithsonian Institution. Some years later the government repaid Mr. Eldred for his time and energy in securing this boulder, congress having appropriated the sum of \$5,664.90 for his relief. This specimen represents the first considerable quantity of copper from the Lake Superior region, a district which has since become one of the important copper-producing regions of the world. It undoubtedly came out of the adjacent copper-bearing rocks, and was probably transported southward a short distance during the Glacial Period in the Glacial drift which now covers that country. The museum specimen, though large and interesting, is not by any means the largest solid piece of copper ever found. Copper masses of immense size are encountered from time to

time in the mines of Lake Superior, and the largest recorded was found in 1857 in the Minnesota mine. It measured 45 feet in length, 22 feet at its greatest width and more than 8 feet at its thickest part, and contained over 90 per cent. pure copper. The total weight was about 420 tons.

THE *Observatory* gives the following from the *Daily Chronicle*, a leading London paper:

Actors and others are discussing what they shall do with the seventh day. There is a tiny island in the South Pacific where there is no seventh day, six days being the allotted span of every week. All travelers know that time is lost or gained in traveling east or west, and Chatham Island is just on the line of demarcation between times and dates. To keep in line with the almanac, therefore, the plan has been adopted of jumping the afternoon of one day and the morning of the next in every week, so that the islanders commence Wednesday, but at 10 o'clock switch on to Thursday afternoon.

UNIVERSITY AND EDUCATIONAL NEWS

THE children of the late James Dwight Dana (Silliman professor of geology at Yale University from 1850 to 1895) have offered to establish a fund which shall ultimately reach \$24,000, the income to be used "to further study and research in geology."

By the will of Frederick Blanchard of Tyngsboro, Harvard University receives for the use of the Museum of Comparative Zoology his entomological collection.

MRS. JOHN JOSEPH ALBRIGHT, of Buffalo, a trustee of Smith College, has given \$60,000 toward the million-dollar fund. This gift is to establish what will be known as the S. Clarke Seelye professorship. The subscriptions now amount to about \$500,000.

THE corporation of Yale University has passed a statute regarding sabbatical years, making it possible for a professor or assistant professor to take a half-year's absence on full salary as an alternative for a full year at half salary. A similar plan was adopted by the trustees of Columbia University several years ago.

ENROLLMENT figures for 1912-13 for all departments of Western Reserve University are announced this week at the university as follows: Adelbert College, 456; the College for Women, 354; the Graduate School (incomplete), 14; the Medical Department, 168; the Law School, 130; the Dental School, 127; the Library School (incomplete), 50, and the School of Pharmacy, 111. The total enrollment for all departments is 1,410. Western Reserve University, in its undergraduate departments, Adelbert College and the College for Women, has decided that, under ordinary conditions, no division of a class for recitation purposes is to exceed twenty-five persons. This vote, applying to all classes, means that in the freshman class of Adelbert College there will be seven divisions, and in the freshman class of the College for Women five divisions in all required subjects. Many large elective classes will be divided into two, three or four divisions.

DR. FRANK PELL UNDERHILL, assistant professor of physiological chemistry in the Sheffield Scientific School, Yale University, has been elected professor of pathological chemistry in the Medical School.

PROFESSOR R. C. PUNNETT has been appointed the first Arthur Balfour professor of genetics at Cambridge University.

DISCUSSION AND CORRESPONDENCE

RADIOTELEGRAPHIC ACHIEVEMENTS BY THE POULSEN SYSTEM

TO THE EDITOR OF SCIENCE: I wish to call attention to the important results being accomplished in this country by the Poulsen system of wireless telegraphy. This system and the work that is being done by it is of great scientific interest as well as practical importance, and inasmuch as almost nothing is generally known about it a brief account of its main features may be of interest to the readers of SCIENCE. Although not a physicist I am led to call attention to this subject because I have waited in vain to see any mention of it in scientific journals, and because numerous students of related subjects whom I know